ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION
206 South Seventeenth Avenue - Phoenix, Arizona 85007-3213

FIFE SYMINGTON
Governor

LARRY S. BONINE
Director

GARY K. ROBINSON
State Engineer

March 20, 1995

Engineering Consultants Section

INFORMATION BULLETIN 95-08

TO: CONSULTANTS

FROM: ENGINEERING CONSULTANTS SECTION

SUBJECT: USAGE OF CORRUGATED HIGH DENSITY POLYETHYLENE PLASTIC PIPE

Enclosed is ADOT's policy on the use of corrugated high density polyethylene plastic pipe (CHDPEPP) effective March 1, 1995. CHDPEPP will be considered a viable alternate for storm drains and pipe culverts on pipe sizes of 12 inches (300mm) to 36 (910mm).

Please contact Terry Otterness, Design Program Manager at (602) 255-7341 if there are any questions.

attachments

ARIZONA DEPARTMENT OF TRANSPORTATION

ROADWAY DESIGN SECTION

OFFICE MEMO

March 1, 1995

TO: ALL DESIGN PERSONNEL
ROADWAY ENGINEERING GROUP, 615E
BRIDGE DRAINAGE SECTION, 613E
STATEWIDE PROJECT MANAGEMENT SECTION, 614E
LOCAL GOVERNMENT SECTION, 630E
ROADSIDE DEVELOPMENT SECTION, 617E

FROM: TERRY H. OTTERNESS THO
Design Program Manager
Roadway Engineering Group, 615E

SUBJECT: **USAGE OF CORRUGATED HIGH DENSITY POLYETHYLENE PLASTIC PIPE**

REVISED PIPE SUMMARY SHEET

REVISED pH AND RESISTIVITY TABLE

The Materials Products Evaluation Committee (MPEC) has approved the recommendations of the Pipe Committee which is a subcommittee of MPEC. This will allow the usage of Corrugated High Density Polyethylene Plastic Pipe (CHDPEPP).

Therefore, CHDPEPP will be considered a viable alternate for storm drains and pipe culverts on pipe sizes of 12 inches (300mm) to 36 inches (910mm). All these sizes are approved for a maximum fill height of 10 feet (3m) and a minimum cover of 12 inches (300mm). This pipe can be used for all ranges of soil resistivity and pH values between 1.25 and 14.0. This high density polyethylene plastic pipe shall conform with ASTM D3350 Cell Classification of 324420C and AASHTO M294 and M252. Requirements for joints to cover water resistant and water tight conditions will be covered in revised ADOT Specifications for CHDPEPP.

The Manning's "n" values applicable to CHDPEPP for smooth pipe design will be considered equivalent to that of concrete pipe and the values for corrugated interior pipe design will be considered equal to that for steel pipes.

The Pipe Summary sheet has been updated to include the usage of CHDPEPP; please see attachment. Consultants may obtain a copy of the new drawing by bringing a blank 3.5" high density DS,HD diskette to room 105E at the Engineering Building, 205 S. 17th Avenue. Please see Bob Trujillo (255-8675) or Dean Sullinger (255-8673). The new drawing will be placed on the ADOT CADD STANDARDS at a future date. Thank you.

A copy of the revised pH and resistivity table is enclosed for your usage.

Please distribute this memo within your Group and to the consultants working under your direction. Contact Tom Scheck (255-8674) or me (255-7341) if you have any questions regarding this material.

THO:THS:tbw
No. memopipe

Attachments

c: District Engineers
Ron Williams
John Louis
Dallis Saxton
Engineering Consultants Section
Utility & Railroad Engineering Section
Joe Roman
Pipe Subcommittee
Paul Hurst
Dan Lance
Dennes Jensen
Rod Curtis
Bob Miller
Gene Hansen
Larry Doescher
Bob Tally
J.J. Liu
George Lopez-Cepero
FHWA

ALLOWABLE TYPES OF CULVERT PIPE FOR VARIOUS pH & RESISTIVITY RANGES

	RESISTIVITY (ohm-cm)	ALLOWABLE PIPE OR COATING
I	2000 or Greater	A-B-C-D-E
II	1500-1999	B-C-D-E
III	1000-1499	B[1]-C-D-E
IV	500-999	C-D-E
V	Less than 500	D-E

Notes:

1) Not allowed when pH is less than 7.2.

2) If the pH is outside range, pipe guage can be increased or bituminous coating applied.

TYPES OF CULVERT PIPE OR COATING

A) Corrugated Galvanized Steel Pipe (CGSP) and Spiral Rib Galvanized Steel Pipe (SRGSP), AASHTO M 36/M 36M and Corrugated Galvanized Steel Structural Plate Pipe (CGSSPP), AASHTO M 167/M 167M.
The pH Range is 6 to 9.[2]

B) Corrugated Aluminized Steel Pipe (CASP) and Spiral Rib Aluminized Steel Pipe (SRASP), AASHTO M 36/M 36M.
The pH Range is 5 to 9.[2]

C) Corrugated Aluminum Pipe (CAP), AASHTO M 196/M 196M and Corrugated Aluminum Structural Plate Pipe (CASPP), AASHTO M 219/M 219M.
The pH Range is 5 to 9.

D) Corrugated High Density Polyethylene Plastic Pipe, (CHDPEPP), AASHTO M 294.
The pH Range is 1.25 to 14 and all Ranges of Resistivity.

E) Bituminous Coated (A,B or C), AASHTO M 190 and AASHTO M 243.

March 1, 1995

NOTE:
FOR PIPE CULVERT PLACEMENT
SEE STANDARD DRAWING C-13.15

SPECIAL NOTE:
PIPE OPTION ENTRYS LEFT BLANK
ARE NOT ALLOWABLE ALTERNATES.

	DESCRIPTION						CSP		Allowable Coating			CAP				RCP		NRCP	NRCIPCP	CHDPEPP			
Station	Plan Ref No. ⬡	⊖ Controlling Fill Height Range (Ft.)	Size, (In.) Corrugated	Size, (In.) Smooth	Length (Ft.)	Skew (Degree)	Corrugation	Wall Thickness (In.)	Zinc	Aluminum	Bituminous	Corrugation	Wall Thickness (In.)	Uncoated	Bit. Coated	Class - Non Trench	Class - Trench	Class	Min Wall Thickness (In.)	AASHTO M-294 Type C	AASHTO M-294 Type S	C-13.20 & C-13.2	Manho
SHEET TOTAL																							

FILL HEIGHT RANGE TABLE (m)

RANGE NO.		1	2	3	4	5	6	7	8	9	10	11	12
FILL HEIGHT (m)	>	1	3	5	8	11	15	20	25	30	40	55	70
	≤	3	5	8	11	15	20	25	30	40	55	70	90

⊖ SHOULD FIELD CONDITIONS VARY FROM THE RANGE INDICATED, CONTACT DESIGN FOR RE-EVALUATION OF PIPE DESIGN REQUIREMENTS.

PIPE CORRUGATION

A	$2\frac{2}{3} \times \frac{1}{2}$	D	6×2
B	3×1	E	3×1 or $9\times2\frac{1}{2}$
C	$9\times2\frac{1}{2}$		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

CSP - CORRUGATED STEEL PIPE
CAP - CORRUGATED ALUMINUM PIPE
RCP - REINFORCED CONCRETE PIPE
NRCP - NON-REINFORCED CONCRETE PIPE
NRCIPCP - NON-REINFORCED CAST-IN-PLACE CONCRETE PIPE
CHDPEPP - CORRUGATED HIGH DENSITY POLYETHYLENE PLASTIC PIPE

END TREATMENT													QUANTITIES				REMARKS
End Sct	Catch Basin, Manhole, Headwall & Junction Structure											Headwall					
						Grate		Inlet Depression									
ule No. 3 Standard or Detail	Location	Height (Ft-In.)	18" Slotted Drn. Length (Ft)	24" Slotted Drn. Length (Ft)	Type	Elev.	Depth (In.)	Length (Ft.)	Standard or Detail	Location			Pipe Exc (CY)	Pipe Bk-fl (CY)	Drn Exc (CY)	Berm/Dike Emb (CY)	

	NAME	DATE
DESIGN		
DRAWN		
CHECKED		
TEAM LEADER		
ROUTE	LOCATION	

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROADWAY DESIGN SECTION

NEW PIPE SUMMARY SHEET

PRELIMINARY
NOT FOR
CONSTRUCTION
OR
RECORDING

SHEET OF

TRACS NO.

___ OF ___